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a measuring probe for dividing the short time coherent broad-band beam into a reference beam and a measuring beam, the measuring probe including a reference arm for guiding and reflecting the reference beam therein, and a measuring arm for guiding and reflecting the measuring beam onto the rough surface, wherein the measuring probe compensates for the difference of optical wavelength so that the measuring beam in the measuring arm and the reference beam in the reference arm are able to interfere with one another;

a superimposing unit for superimposing the reflected measuring beam on the reflected reference beam;

a beam splitting and receiving unit for splitting the superimposed beam into at least two beams having different wavelengths and for converting the at least two beams into electrical signals;

an analyzer for determining the one of the shape and the distance of the rough surface as a function of a phase difference of the electrical signals; and

a remote unit separate from the measuring probe, wherein the at least one spatially coherent beam gun unit, the first beam splitter, and the first device are arranged in the remote unit.

12. (Amended) The measuring device according to claim 11, wherein the remote unit is a modulation interferometer.

13. (Amended) The measuring device according to claim 11, wherein the at least one spatially coherent beam gun unit includes a light source for emitting the short time coherent broad-band beam.

14. (Amended) The measuring device according to claim 11, further comprising:

an optical fiber arrangement for coupling the remote unit and the measuring probe to one another.

15. (Amended) The measuring device according to claim 11, wherein the remote unit further includes a second beam splitter that receives the first partial beam and the second partial beam, the first partial beam and the second partial beam being superimposed on one another at the second beam splitter, the second beam splitter forwarding the superimposed beam to

the measuring probe.

16. (Amended) The measuring device according to claim 13, wherein the at least one spatially coherent beam gun unit includes a second light source, the second light source having a short time coherence and being broad-band and spatially coherent, the second light source being operable one of for light amplification and as a backup light source.

17. (Amended) The measuring device according to claim 11, further comprising:
a second device for frequency shifting the first partial beam with respect to the second partial beam, the second device being arranged in the beam path of one of the first partial beam and the second partial beam, the first device and the second device being acoustical-optical modulators.

18. (Amended) The measuring device according to claim 14, wherein:
the beam splitting and receiving unit includes a spectral device and a downstream photo-detector matrix, the spectral device splitting the superimposed beam into a plurality of wavelengths, the downstream photo-detector matrix selectively receiving the plurality of wavelengths;

the beam splitting and receiving unit is mounted in the remote unit;

the beam splitting and receiving unit is coupled to the measuring probe via the optical fiber arrangement; and

phase differences of signals from individual detectors of the photo-detector matrix are used for determining the one of the shape and the distance of the rough surface.

19. (Amended) The measuring device according to claim 11, wherein:

the measuring probe has a beam splitter, the measuring probe being one of a Michelson interferometer and a Mirau interferometer; and

an optical path difference provided by the measuring arm and the reference arm compensates for the difference in optical wavelengths produced by the time delay element.

20. (Amended) The measuring device according to claim 14, further comprising:

a second beam splitting and receiving unit arranged in the remote unit; and